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**Hairston et al.**

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(54) **METHODS FOR MAKING A COMPOSITE  
BACKPACK FRAME**

(56) **References Cited**

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patent is extended or adjusted under 35  
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CPC ..... **B29C 70/34** (2013.01); **A45F 3/04**  
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(58) **Field of Classification Search**  
CPC combination set(s) only.  
See application file for complete search history.

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(57) **ABSTRACT**

A backpack and frame are disclosed, as are methods of  
making the frame using composite materials and compres-  
sion molding. The backpack frame is designed to be at least  
partially internal and is of unitary construction using a  
resin-impregnated material, such as resin-impregnated car-  
bon fiber sheets with selective reinforcement by interstitial  
layers. The frame has a mid-back portion that includes  
openings for independently positionable shoulder straps and  
a lower back portion that provides for a rotatable connection  
to a belt assembly. A pair of curved stay portions is con-  
tiguous with the mid-back portion of the frame and curves  
outwardly as the stay portions extend downwardly. The  
frame is preferably curved to match the curvature of the  
human back.

**13 Claims, 10 Drawing Sheets**

